

well as the communication networks within which they cooperate. It should be appreciated, however, that a focus of the present disclosure is the enablement of an HTS display screen that is capable of providing improved tactile feedback to a user of the device.

What is claimed is:

1. A handheld electronic device, comprising:
 - a hand cradleable body;
 - a display screen disposed on said body, said display screen configured to display to a user of the device images of buttons, icons, and/or other graphical user interface items;
 - a touch-sensing assembly with components disposed on or adjacent to said display screen, said touch-sensing assembly being adapted to recognize when the user has touched said display screen and to discriminate where the user has touched the display screen; and
 - a haptic assembly with components disposed on an upper surface of said display screen, said haptic assembly being adapted to provide tactile stimulation to the user when the user has touched the display screen at a location corresponding to the image of a button, icon, or other graphical user interface item displayed on the display screen.
2. The device of claim 1, wherein said haptic assembly is adapted to provide electrical stimulation to the user.
3. The device of claim 2, wherein said haptic assembly comprises transparent electrical conductors arranged in a grid on the upper surface of the display screen.
4. The device of claim 3, wherein the transparent electrical conductors are arranged in the form of interleaved combs.
5. The device of claim 3, wherein the transparent electrical conductors are formed from one of indium tin oxide and antimony tin oxide.
6. The device of claim 2, wherein the haptic assembly is adapted to provide electrical stimulation in the form of pulses.
7. The device of claim 2, wherein the device is configured such that the electrical stimulation varies as a function of the button, icon, or other graphical user interface item touched by the user.
8. The device of claim 2, further comprising a skin resistance-measuring circuit, wherein the level of electrical stimulation provided by the haptic assembly is varied as a function of skin resistance measured by the resistance-measuring circuit.
9. The device of claim 2, wherein said haptic assembly is configured to deliver between about 1 microamperes and about 5 milliamps of current to a user of the device.
10. The device of claim 9, wherein said haptic assembly is configured to deliver between about 2 and about 3 milliamps of current to a user of the device.
11. The device of claim 1, wherein the display is an LCD display.
12. The device of claim 11, wherein the display is a color LCD display.
13. A haptic feedback display screen for a handheld electronic device, comprising:

- a display screen configured to at least display images of buttons;
- a touch-sensing assembly with components disposed on or adjacent to said display screen, said touch-sensing assembly being adapted to recognize when a user has touched said display screen and to discriminate where the user has touched the display screen; and
- a haptic assembly with components disposed on an upper surface of said display screen, said haptic assembly being adapted to provide tactile stimulation to the user when the user has touched the display screen.

14. The haptic feedback display screen of claim 13, wherein said haptic assembly is adapted to provide electrical stimulation to the user.

15. The haptic feedback display screen of claim 14, wherein said haptic assembly comprises transparent electrical conductors arranged in a grid on the upper surface of the display screen.

16. The haptic feedback display screen of claim 14, wherein the transparent electrical conductors are arranged in the form of interleaved combs.

17. The haptic feedback display screen of claim 14, wherein the transparent electrical conductors are formed from one of indium tin oxide and antimony tin oxide.

18. The haptic feedback display screen of claim 14, wherein the haptic assembly is adapted to provide electrical stimulation in the form of pulses.

19. The haptic feedback display screen of claim 14, further comprising a skin resistance-measuring circuit, wherein the level of electrical stimulation provided by the haptic assembly is varied as a function of skin resistance measured by the resistance-measuring circuit.

20. The haptic feedback display screen of claim 14, wherein said haptic assembly is configured to deliver between about 1 microamperes and about 5 milliamps of current to a user of the device.

21. The device of claim 20, wherein said haptic assembly is configured to deliver between about 2 and about 3 milliamps of current to a user of the device.

22. A method of providing haptic feedback to a user of a handheld electronic device based upon touch engagement of a touch sensitive display screen on the handheld electronic device, wherein the method comprises:

- displaying images of buttons or icons on a touch-sensitive display screen of a handheld electronic device;
- sensing touch engagement by the user of the touch-sensitive display screen;
- determining the location of the sensed touch engagement;
- providing haptic feedback to the user upon touch engagement of the touch-sensitive display screen.

23. The method of claim 22, further comprising providing an electrical stimulation to the user as the haptic feedback.

24. The method of claim 23, further comprising adapting said electrical stimulation in response to the location of the sensed touch engagement.

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